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Case Report

A suggestive case report of acute mesenteric venous thrombosis diagnosed at Computed Tomography Angiography^{☆,☆☆}

Francesco Messina, MD^{*}, Carmela Tebala, MD, Grazia Calabrese, MD, Lorena Turano, MD, Nicola Arcadi, MD

Radiology Unit of Riuniti Hospital, Azienda Ospedaliera Grande Ospedale Metropolitano (G.O.M.)
"Bianchi-Melacrino-Morelli", Reggio Calabria, Italy

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ABSTRACT

Acute mesenteric venous thrombosis (MVT) is a rare but potentially fatal condition with superior mesenteric vein being the most common site of thrombosis development. It is more common in patients with underlying disorders which cause disruptions to Virchow's Triad of hypercoagulability, stasis and endothelial injury. The disease is often associated with intestinal ischemia in its acute form, further complicating its management. We present a case of acute superior mesenteric venous thrombosis, in a 65 years old man with initial features of intestinal infarction, diagnosed at Computed Tomography Angiography (CTA) scan. However, the patient was stable, with a nonperitonitic abdomen, and was subsequently managed with conservative measures.

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Introduction

Acute mesenteric venous thrombosis (MVT) is a comparatively rare cause of mesenteric ischemia. While arterial thrombosis accounts for the majority of mesenteric ischemia, venous thrombosis underlies only about 6%-9% of mesenteric ischemia cases. It is typically discovered either as an incidental finding on abdominal CT or during the workup for abdominal pain. Acute presentation is generally characterized by persistent, intense abdominal pain with progression to peritonitis and sepsis in more severe cases.

Case presentation

A 65 years old man was admitted to the Emergency Department of our Hospital with a 3 days history of progressively worsening upper abdominal pain associated with multiple episodes of dark coloured emesis and loose bowel motions. He had a background of ulcerative colitis diagnosed at the age of 55yo which required one course of oral steroid (with no further follow-up or treatment). At Emergency Department his initial observations include: Heart Rate 125/min; Blood Pressure 110/80 mmHg; Respiratory Rate 35/min; Temperature 36.9C

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^{*} Corresponding author.

E-mail address: fmessina1@hotmail.it (F. Messina).

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Fig. 1 – Abdomen radiography had documented only a distension of the intestinal loops, without any signs of sub-diaphragmatic free air.

and Oxygen Saturation of 98%. Oro-pharyngeal swab was negative for SARS-CoV-2 by RT-PCR. The patient was also clinically dehydrated. Abdominal examination revealed a distended abdomen that was tender in the left upper quadrant with no evidence of an obvious peritonism. In the laboratory tests there were increased values of PCR and procalcitonin, but preserved renal and hepatic functions. Arterial blood gas analysis was consistent with normal anion gap metabolic acidosis with a pH of 7.29 and lactate of 4.6. The patient responded to initial fluid resuscitation.

Immediately, the first radiological exam carried out in emergency was an abdomen radiography, which documented only a distension of the intestinal loops, without any signs of subdiaphragmatic free air (Fig. 1).

As the patient's abdominal pain symptoms continued, we had performed a Computed Tomography Angiography (CTA) study, with a 64 ms multidetector scanner, and the images so obtained were analyzed with a slice-thickness of 1.2 mms and MPR reconstructions (axial, sagittal, and coronal).

CTA had documented (Fig. 2 a, b, c) the presence of an extensive hypodense, thrombotic, intraluminal filling defect, in the context of mesenteric-portal venous confluence, with extension at the level of the right intra-hepatic portal branch. In addition to the superior mesenteric vein, the hypodense thrombotic apposition also affected a large part of the venous structures afferent to it, many of which show blurred walls for long stretches.

CTA had also documented (Fig. 3 a, b) the presence of concentric parietal thickening with hypodense appearance of

some intestinal loops of the small intestine (distal ileal), located mainly in the lower right abdominal quadrant, with a significant alteration in the density of the adjacent adipose tissue, imbibed and with some lymphnodes in the context. A fair amount of free, hypodense fluid was identified in the peri-hepatic area, in the right parieto-colic shower, up to the pelvic cavity. The mesentery was diffusely imbibed and suffused, with a fair amount of fluid also disposed between the loops of the small intestine.

These alterations were due to the ischemic vascular nature (intestinal ischemia), in an initial state.

Acute mesenteric venous thrombosis was diagnosed and management options were explored. Although the CTA appearances were suggestive of intestinal ischemia, the patient had no signs of peritonism, and so the decision was made for a conservative management (heparin infusion; a nasogastric tube was inserted; central venous line, arterial line and a urinary catheter were inserted). The patient, after a total of about three weeks in our Hospital, had returned at home. We'll made an abdomen CT control scan one month after his discharge.

Discussion

The incidence of MVT is 3 per 100,000 patient-years [1] and accounts for 5%-15% of mesenteric ischemia [2]. Superior mesenteric vein is the most common site of thrombi formation, resulting in impaired venous return and subsequent venous engorgement and bowel ischemia [3]. Ileum and jejunum are by far the most commonly involved bowel regions [4]. Acute MVT presents almost universally with abdominal pain, often out of proportion with physical exam. Occult fecal blood is present in about 40% of cases. Increasing abdominal tenderness, distention, and ascites are worrisome for bowel ischemia, while progression to fever, peritoneal signs, and hemodynamic instability are concerning for bowel infarction and perforation. Interestingly, mesenteric venous thrombosis with portal vein involvement has a lower risk of developing transmural infarction compared to isolated mesenteric vein alone. And MVT of the more distal mesenteric veins tend to produce higher rates of bowel infarction versus MVT of the more proximal SMV and portal vein [5,6]. Comparable to venous thrombosis in general, Virchow's triad is crucial in the pathogenesis of mesenteric vein thrombosis [7]. The mainstay of diagnosis is Computed Tomography Angiography of abdomen. Findings on contrast-enhanced abdominal CT fall into three categories: circumferential bowel wall thickening, vascular changes, and nonmural/nonvascular signs. Circumferential wall thickening is the most common CT finding in acute MVT. Hypoattenuated thickened bowel wall is highly suggestive of venous bowel infarction. A "halo sign" indicates stratification of the bowel wall into layers of attenuation by a central zone of edema. Pneumatosis intestinalis may also be visualized in cases of advanced ischemia. Venous filling defects are apparent in over 90% of cases. Venous enlargement around the

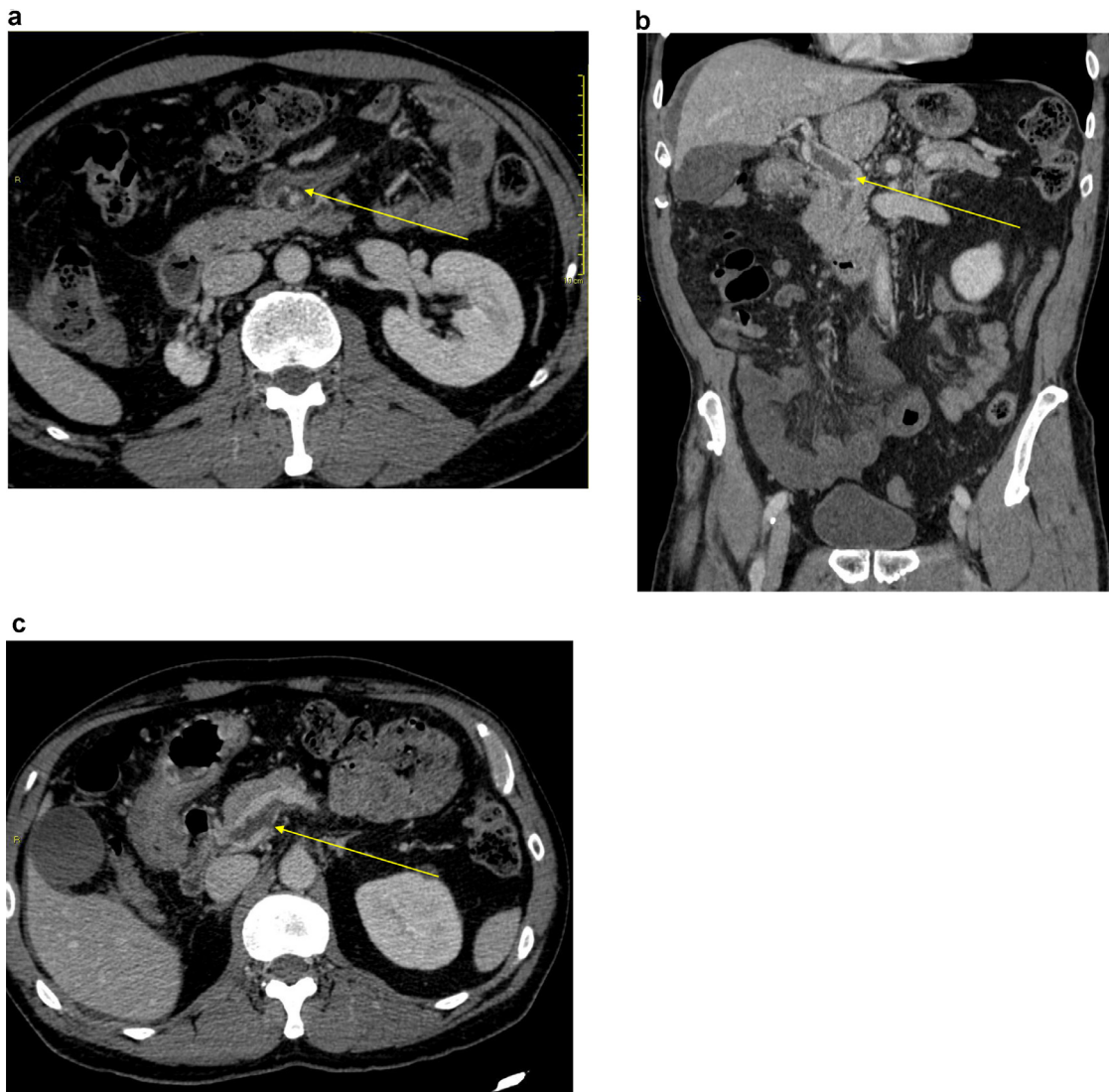


Fig. 2 – (a,b,c). Computed Tomography Angiography (MPR reconstructions – axial/coronal) had documented (yellow arrows in the pictures) the presence of an extensive hypodense, thrombotic, intraluminal filling defect, in the context of mesenteric-portal venous confluence, with extension at the level of the right intra-hepatic portal branch. In addition to the superior mesenteric vein, the hypodense thrombotic apposition also affected a large part of the venous structures afferent to it, many of which show blurred walls for long stretches.

clotis more suggestive of acute MVT, while venous atrophy is more suggestive of chronic MVT. Mesenteric fat edema and ascites are particularly prominent in MVT as opposed to arterial thrombosis due to the congestive nature of the disease. Bowel dilatation secondary to ischemic ileus is also seen [8,9]. The prognosis of patients with mesenteric venous thrombosis who responded to conservative management has been reported to be as high as 93% at 3 years. However, it is often limited by the severity of the underlying disease. Long term complications such as recurrence of thrombosis and intestinal ischemic strictures can also develop with variable reported incidences in small studies [10].

Conclusions

This is a case of acute mesenteric venous thrombosis that is notable for its idiopathic origin that had required an urgent clinical management of the patient. Acute mesenteric venous thrombosis is a rare but important cause of intestinal ischemia. Early diagnosis requires a high index of clinical suspicion. Computed Tomography had an important key-role for the diagnosis and evaluation of the severity of the mesenteric venous thrombosis, and for the best outcome/management of the patients.

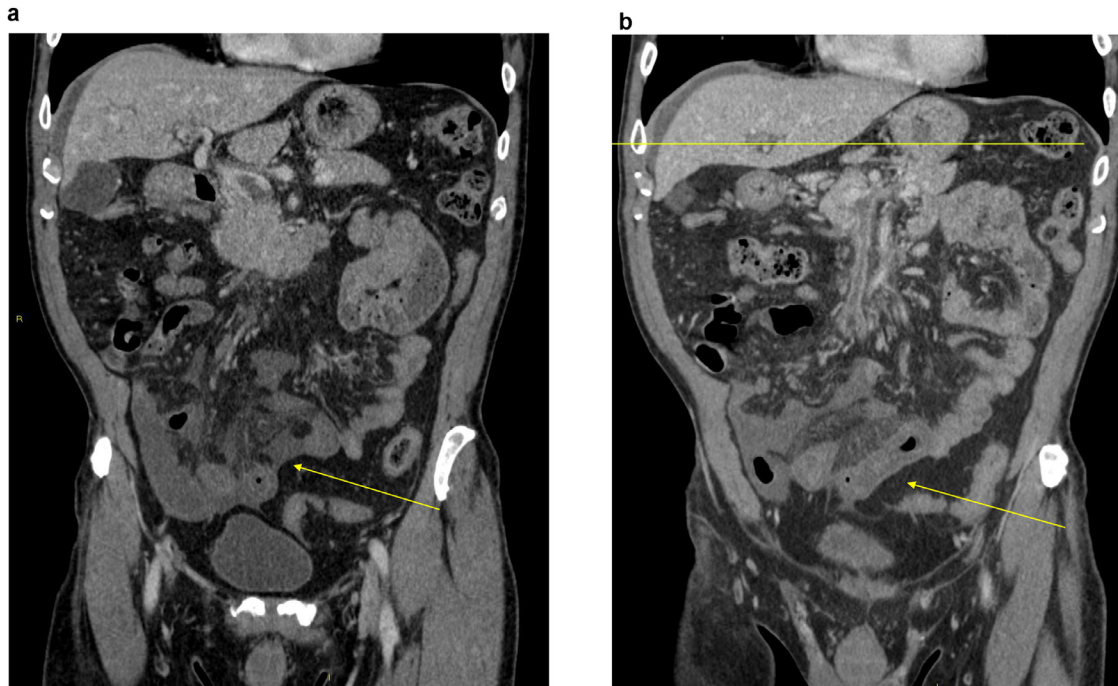


Fig. 3 – (a,b). Computed Tomography Angiography (MPR coronal reconstructions) had also documented the presence (yellow arrows in the pictures) of concentric parietal thickening with hypodense appearance of some intestinal loops of the small intestine (distal ileal), located mainly in the lower right abdominal quadrant, with a significant alteration in the density of the adjacent adipose tissue, imbided and with some lymphnodes in the context. A fair amount of free, hypodense fluid was identified in the peri-hepatic area, in the right parieto-colic shower, up to the pelvic cavity. The mesentery was diffusely imbided and suffused, with a fair amount of fluid also disposed between the loops of the small intestine. These alterations were due to the ischemic vascular nature (intestinal ischemia), in an initial state.

Patient consent

Patient confirmed consent for publication of our case report.

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